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10/528,363	10/03/2005	Zhengguo Li	212/692US	7049

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EXAMINER	
ROBERTS, JESSICA M	

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2621	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/528,363	LI ET AL.	
	Examiner	Art Unit	
	JESSICA ROBERTS	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 February 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,22 and 23* is/are rejected.

7)☒ Claim(s) *3-21* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicants argument regarding the Examiner has fails to provide any motivation or rationale for the proposed combination of Wang and Li, other than the benefit provided by the claimed invention.

The Examiner respectfully disagrees. Wang discloses that to date, conventional motion video encoders have failed to provide satisfactory motion video image quality within the available bandwidth. Li teaches a rate control scheme for video over the Internet by adopting a fluid-flow traffic model and a new quadratic rate-distortion (R-D) model. Some simple control theory rather than a heuristic method is used to compute the target rate for each frame. Our scheme is better than some other existing schemes in the sense that our scheme can adapt itself in time to the variation of channel bandwidth, the number of skipped frames is reduced and the average PSNR is usually improved. Thus, our scheme is very attractive for video over the internet. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of Li with Wang for providing improved rate control.

As to Applicants argument that there is no indication that either Li or Wang were in any way deficient, such that the artisans would expect an improvement by combing them.

The Examiner respectfully disagrees. See the response provided above.

As to Applicants argument regarding Wang does not teach the determination of a desired frame rate based on available computational resources for the encoding

process as recited in claim 1. Rather, Wang is completely silent about such a feature. Thus, the claimed invention cannot be achieved by combining Wang and Li, and a prima facie case of obviousness has not been made out.

The Examiner respectfully disagrees. The Applicant has no clear and definite definition of "computational resources". Wang teaches the target frame size for the current P-frame is determined from the time elapsed between the P-frame and the previous P-frame and the amount of total available bandwidth, col. 7 line 50 to col. 8 line 1). Further, another important consideration in maximizing motion video image quality within limited bandwidth is the frame rate, i.e., the number of frames encoded in a particular period of time. Video signal encoder 100 includes a frame rate controller 120 which adjusts the frame rate of the encoded video signal as necessary to preserve the motion video signal quality and to prevent loss of frames due to exceeded bandwidth limitations. Frame rate controller 120 controls the frame rate of the encoded video signal according to logic flow diagram 800 (FIG. 8) in which processing begins with step 802. In step 802, frame rate controller 120 (FIG. 1) retrieves from Q adjuster 116 the cumulative bandwidth balance which is described above. As described above, the cumulative bandwidth balance represents a cumulative surplus or deficit of bandwidth resulting from previously encoded frames of the motion video signal. Processing transfers to test step 804 (FIG. 8) in which frame rate controller 120 (FIG. 1) compares the cumulative bandwidth balance to a maximum threshold. As described more completely below, the maximum threshold is periodically adjusted by frame rate controller 120 and depends upon the current frame rate at which video signal encoder

100 is encoding frames. Initially, video signal encoder 100 encodes frames at a rate of 20 frames per second and the maximum threshold is 33% of a maximum allowable bandwidth deficit, e.g., three (3) seconds, and is therefore one (1) second in one embodiment. If frame rate controller 120 determines that the cumulative bandwidth balance indicates a bandwidth deficit which is greater than the maximum threshold, processing transfer to step 806 (FIG. 8) in which frame rate controller 120 (FIG. 1) reduces the frame rate. In one embodiment, frame rate controller 120 controls video signal encoder 100 to encode at one of a limited number of discrete frame rates by passing less than all frames from source video signal 1540 to frame buffer 102 for encoding through I/P framer 106. For example, frame rate controller 120 passes only every nth frame where represents an integer frame rate. When n equals one (1), frame rate controller 120 passes all frames for encoding. Conversely, if frame rate controller 120 determines in test step 804 (FIG. 8) that the cumulative bandwidth balance indicates a bandwidth deficit which is not greater than the maximum threshold, processing transfers to test step 808. In test step 808, frame rate controller 120 (FIG. 1) compares the cumulative bandwidth balance to a minimum threshold. If frame rate controller 120 determines that the cumulative bandwidth balance indicates a bandwidth deficit which is less than the minimum threshold, processing transfers to step 810 (FIG. 8) in which frame rate controller 120 (FIG. 1) increases the frame rate. Like the maximum threshold described above, the minimum threshold depends on the currently used frame rate and is adjusted by frame rate controller 120 in the manner described below. Initially, the frame rate currently used by video signal encoder 100 is at a

predetermined maximum, e.g., 20 frames per second in one embodiment, and the minimum threshold is negative infinity. Therefore, when the frame rate is at the predetermined maximum, processing never transfers to step 810 (FIG. 8) and the frame rate is never increased. If frame rate controller 120 (FIG. 1) determines that the cumulative bandwidth balance indicates a bandwidth deficit which is not less than the minimum threshold, processing according to logic flow diagram 800 (FIG. 8), and therefore processing of the current frame by frame rate controller 120 (FIG. 1), completes (col. 15 line 10 to col. 16 line 8. Thus it is clear to the Examiner that Wang teaches to determine the frame rate base on the available channel bandwidth and the balance of the a cumulative surplus or deficit of bandwidth from previously encoded frames (computational resource) which reads upon the limitations as claimed. Thus, the Examiner maintains that the Wang (modified by Li) teaches the limitation as claimed. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

As to Applicants argument regarding Li does not teach the determination of a target buffer level based on the position of the Inter-frame with respect to the I-frame. Thus, the claimed invention cannot be achieved by combining Wang and Li because two distinct elements of claims 1, 2, 22, and 23 are not found in either reference and a prima facie case of obviousness has not been made out.

The Examiner respectfully disagrees. Li teaches where Bc(n) denote the buffer level at time n. It can be known from the fluid-flow traffic model ,that Bc(n+1)=max (0, Bc(n)+T(n) – u(n)/Fr,] where T(n) is the actual bit rate, Fr is the frame rate, and u(n) is the channel rate. This is illustrated in fig.1. Equation (1) can be regarded as the fluid-flow traffic model for the dynamics of the buffer and it will be used to determine the target bit rate for each frame, see 2. Two Basic Models. Further disclosed by Li is that the frame layer control is composed of three stages: initialization, pre-encoding, and post-encoding. A. Initializing stage. In this stage, two major tasks that the encoder has to complete with respect to the frame level control include: initializing the buffer size based on latency requirements; initializing the buffer fullness (before the encoding of the I frames); if the first group of pictures (GOP) is encoded, then, it is et a Ba/8 (Ba is the buffer size). Otherwise, it is et at the end level of the previous GOP. The I frame is encoded using an initial value Qo. Then the remaining available bits for encoding the subsequent P frames and B frames can be calculated as Ro(i)=TBi-ki+Ba/8-Bc(i) where Ro(i) is the remaining available bits for encoding all P frames and B frames, Bc(i) is the initial buffer level for The ith GOP, Bc(1)=Ba/8 and ki is the number of bits used for the

ith I frame, see 3.2 Frame Layer-Rate Control. Since Li teaches Bc(n) denote the buffer level at time n. It can be known from the fluid-flow traffic model ,that Bc(n+1)=max (0, Bc(n)+T(n) – u(n)/Fr,] where T(n) is the actual bit rate, Fr is the frame rate, and u(n) is the channel rate and initializing the buffer fullness (before the encoding of the I frames); if the first group of pictures (GOP) is encoded, then, it is et a Ba/8 (Ba is the buffer size). Otherwise, it is set at the end level of the previous GOP. The I frame is encoded using an initial value Qo. Then the remaining available bits for encoding the subsequent P frames and B frames can be calculated as Ro(i)=TBi-ki+Ba/8-Bc(i) where Ro(i) is the remaining available bits for encoding all P frames and B frames, Bc(i) is the initial buffer level for The ith GOP, Bc(1)=Ba/8 and ki is the number of bits used for the ith I frame, it is clear to the Examiner that Li teaches to determine the target buffer level based on the frame rate (see equation 1) as well as determining the target buffer level by taking into account the encoding order of the GOP (frame position) which reads upon the claimed limitation). Thus, the Examiner maintains that Li teaches the limitation as claimed. Also, it is the combination of the Wang (modified by Li) that teaches applicants claimed invention). In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, It would have

been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of Li with Wang for providing improved rate control (see Abstract, Li).

As to Applicants argument that it is not possible that one of skill in the art would be motivated to combine Wang and Li to achieve the claimed invention, nor is it possible to "identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does" per KSR Int'l Co. v. Teleflex Inc., 550 U.S. 398, 418 (2007), because the references do not disclose all the recited claim elements. That is, even if there if there is some reason to combine Wang and Li, they cannot be combined so as to achieve the combination of claims 1, 2, 22, and 23 which require the steps (or a device adapted to perform the steps) of determining a desired frame rate based on available computational resources for the encoding process and determining a target buffer level based on the position of the Inter-frame with respect to the I-frame as recited in claim 1.

The Examiner respectfully disagrees, and directs the Applicant to the response to Applicants first argument.

As to Applicants argument regarding claim 2, that Wang and Li do not disclose at least two elements of the claims, so that no prima facie case of obviousness is established.

The Examiner respectfully disagrees. Wang (modified by Li) as a whole teaches Applicants limitations in claim 1. For further clarification, Wang teaches determining a desired frame rate based on an available bandwidth of a channel which is

used for transmitting the video sequence and on available computational resources for the encoding process (The target frame size for the current P-frame is determined from the time elapsed between the current P-frame and the previous frame and the amount of total available bandwidth, col. 7 line 50 to col. 8 line 1). Wang is silent in regards to Determining a target buffer level based on the desired frame rate and the position of the Inter-frame with respect to the I-frame; and Determining a target bit rate based on the target buffer level and the available channel bandwidth, wherein the target bit rate is used for controlling the rate for encoding the video sequence.

However Li teaches determining a target buffer level based on the desired frame rate (Li teaches let Bc(n) denote the buffer level at time n. It can be know from the fluid-flow traffic model that Bc(n+1)=max (0, Bc(n)+T(n)-u(n)/Fr,}, where T(n) is the actual bit rate, Fr is the frame rate, and u(n) is the channel rate, this is illustrated in fig. 1, see 2. Two Basic Models) and the position of the Inter-frame with respect to the I-frame (see 3.2 Frame-layer Rate control); and Determining a target bit rate based on the target buffer level and the available channel bandwidth, wherein the target bit rate is used for controlling the rate for encoding the video sequence (Li teaches let Bc(n) denote the buffer level at time n. It can be know from the fluid-flow traffic model that Bc(n+1)=max (0, Bc(n)+T(n)-u(n)/Fr,}, where T(n) is the actual bit rate, Fr is the frame rate, and u(n) is the channel rate, this is illustrated in fig. 1. Equation (1) can be regarded as the fluid-flow traffic model for the dynamics of the buffer and it will be used to determine the target bit rate for each frame, 2. Two Basic Models. Since Li discloses to use equation (1), which includes determining the buffer level based on the frame rate, channel rate

and actual bit rate, and is used to determine the target bit rate for each frame, it is clear to the Examiner that the target bit rate is based on the buffer level, frame rate, channel rate and actual bit rate).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of Li with Wang for providing improved rate control.

Wang is silent in regards to determining a target encoding time interval for the Inter-frame; and determining the desired frame rate based on the determined time target encoding time interval.

However, Nago teaches determining a target encoding time interval for the frame (In response to a result of the encoding operation, the encoding time measurement unit 17 determines a time interval T required from picture encoding for each image (step S1), col.12 line 19-22); and determining the desired frame rate based on the determined target encoding time interval (In response to a result of such determination, the coding frame rate calculator 18 calculate how many frame can be produced per second, or coding frame rate for each image format. col.12 line 22-25).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of Nago with Wang (modified by Li) for providing improved image quality.

The Examiner maintains the objection to the specification because pages 1-2 are missing from the specification in the record (US-10/528,363). The specification begins on page 3. Since Applicant has submitted the full specification in PCT/SG02/000206,

Applicant should amend the specification by including the missing pages (pg. 1-2) to be incorporated to specification of US-10/528,363.

Acknowledgment of Amendment

Applicants Amendment filed on 12/01/2009 overcomes the following objection(s)/rejection(s):

The rejection of claims 1-21 under 35 U.S.C. 101 has been withdrawn in view of Applicants amendment.

The rejection of claims 18-21 under 35 U.S.C. 112 second paragraph has been withdrawn in view of Applicants amendment.

The rejection of claims 22-23 under 37 CFR 1.75 has been withdrawn in view of Applicants amendment.

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

(a) TITLE OF THE INVENTION.
(b) CROSS-REFERENCE TO RELATED APPLICATIONS.
(c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
(d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
(e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A

COMPACT DISC.

(f) BACKGROUND OF THE INVENTION.

(1) Field of the Invention.

(2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.

(g) BRIEF SUMMARY OF THE INVENTION.

(h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).

(i) DETAILED DESCRIPTION OF THE INVENTION.

(j) CLAIM OR CLAIMS (commencing on a separate sheet).

(k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).

(l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1-2, 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al., US-6,118,187 in view of Li et al., "A NOVEL RATE CONTROL SCHEME FOR VIDEO OVER THE INTERNET".

Regarding **claim** 1, Wang teaches A method for controlling the encoding rate of an encoder for encoding a video sequence, wherein the video sequence comprises a plurality of Group Of Pictures, wherein each Group of Picture comprises at least an I-frame and an Inter-frame, the method comprising the following for the encoding of each Inter-frame in the Group of Picture: Determining a desired frame rate based on an available bandwidth of a channel which is used for transmitting the video sequence and on available computational resources for the encoding process (The target frame size for the current P-frame is determined from the time elapsed between the current P-frame and the previous frame and the amount of total available bandwidth, col. 7 line 50 to col. 8 line 1). Wang is silent in regards to Determining a target buffer level based on the desired frame rate and the position of the Inter-frame with respect to the I-frame; and Determining a target bit rate based on the target buffer level and the available channel bandwidth, wherein the target bit rate is used for controlling the rate for encoding the video sequence.

However Li teaches determining a target buffer level based on the desired frame rate (Li teaches let Bc(n) denote the buffer level at time n. It can be know from the fluid-flow traffic model that Bc(n+1)=max (0, Bc(n)+T(n)-u(n)/Fr,}, where T(n) is the actual bit rate, Fr is the frame rate, and u(n) is the channel rate, this is illustrated in fig. 1, see 2. Two Basic Models) and the position of the Inter-frame with respect to the I-frame (see

3.2 Frame-layer Rate control); and Determining a target bit rate based on the target buffer level and the available channel bandwidth, wherein the target bit rate is used for controlling the rate for encoding the video sequence (Li teaches let Bc(n) denote the buffer level at time n. It can be know from the fluid-flow traffic model that Bc(n+1)=max (0, Bc(n)+T(n)-u(n)/Fr,}, where T(n) is the actual bit rate, Fr is the frame rate, and u(n) is the channel rate, this is illustrated in fig. 1. Equation (1) can be regarded as the fluid-flow traffic model for the dynamics of the buffer and it will be used to determine the target bit rate for each frame, 2. Two Basic Models. Since Li discloses to use equation (1), which includes determining the buffer level based on the frame rate, channel rate and actual bit rate, and is used to determine the target bit rate for each frame, it is clear to the Examiner that the target bit rate is based on the buffer level, frame rate, channel rate and actual bit rate).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of Li with Wang for providing improved rate control.

Regarding **claim 22**, see the rejection and analysis made for claim 1, except this is a claim to an apparatus with the same limitations as claim 1. Thus the rejection and analysis made for claim 1 also applies here.

4. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al., US-6,118,187 in view of Li et al., "A NOVEL RATE CONTROL SCHEME FOR

VIDEO OVER THE INTERNET" and further in view of Rajagopalan et al., US-6,181,742.

Regarding **claim 23,** Wang (modified by Li) as a whole teaches everything as claimed above, see claim 22. In addition, the apparatus according to claim 22, being a video encoding device wherein the target buffer level is determined based on the complexity of the Inter-frame.

However, Rajagopalan teaches the apparatus according to claim 22, being a video encoding device wherein the target buffer level is determined based on the complexity of the Inter-frame (Rajagopalan teaches where in various embodiments, methods are provided for allocating bits to pictures in accordance with the VBV constraints for operation at both constant and variable bit rates. In one embodiment the instantaneous rate of encoding is modified from the desired encoding rate by multiplying the desired rate with the ratio of the estimated coding complexity of this picture and the accumulated statistics of the encoding complexities of all the previously encoded pictures. Buffer constraints are then imposed to maintain VBV compliance, col. 3 line 9-18. Since Rajagopalan discloses allocating bits to pictures in accordance with the VBV constraints for operation at both constant and variable bit rates. In one embodiment the instantaneous rate of encoding is modified from the desired encoding rate by multiplying the desired rate with the ratio of the estimated coding complexity of this picture and the accumulated statistics of the encoding complexities of all the previously encoded pictures. Buffer constraints are then imposed to maintain VBV compliance, it is clear to the Examiner that Rajagopalan discloses to maintain buffer level based on the bits

allocated to pictures in accordance to the VBV compliance (preventing overflow or underflow of the buffer), which reads upon the claimed limitation.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of Rajagopalan with Wang (modified by Li) for providing a system and techniques for allocating target bits to encode units of digital information such as pictures so that bit allocation constraints are met while maintaining consistently good quality (e.g. for pictures, visual quality) in the decoded information.

5. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al., US-6,118,187 in view of Li et al., "A NOVEL RATE CONTROL SCHEME FOR VIDEO OVER THE INTERNET" and further in view of Nago et al., US-6,567,117.

Regarding **claim 2,** Wang (modified by Li) as a whole teaches everything as claimed above, see claim 1. Wang is silent in regards to the method for rate control according to claim 1, further comprising: Determining a target encoding time interval for the Inter-frame; and Determining the desired frame rate based on the determined target encoding time interval.

However, Nago teaches determining a target encoding time interval for the frame (In response to a result of the encoding operation, the encoding time measurement unit 17 determines a time interval T required from picture encoding for each image (step

S1), col.12 line 19-22); and determining the desired frame rate based on the determined target encoding time interval (In response to a result of such determination, the coding frame rate calculator 18 calculate how many frame can be produced per second, or coding frame rate for each image format. col.12 line 22-25).

6. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of Nago with Wang (modified by Li) for providing improved image quality.

Allowable Subject Matter

7. Claims 3-18 and 19-21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter: The present invention as claimed involves a method for controlling the rate for encoding a video sequence. The novel features include wherein the target encoding time interval for the Inter-frame is determined based on the available channel bandwidth and an average encoding time interval used for encoding the Inter-frame, wherein the average encoding time interval for the Inter-frame is proportional to the available computational resources for the encoding process.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JESSICA ROBERTS whose telephone number is (571)270-1821. The examiner can normally be reached on 7:30-5:00 EST Monday-Friday, Alt Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha D. Banks-Harold can be reached on (571) 272-7905. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Marsha D. Banks-Harold/
Supervisory Patent Examiner, Art Unit 2621
/Jessica Roberts/
Examiner, Art Unit 2621